

CLAIMS

1. A computerized system for providing high speed fault-tolerant storage of information, the system comprising:

an array of computer storage devices, said computer storage devices being capable of storing computer-readable information,

said array of computer storage devices including a plurality of computer storage devices, computer-readable information stored on said plurality of computer storage devices,

said computer-readable information being stored on said plurality of computer storage devices in data redundant fashion,

said array being configured to appear as a unitary block of computer-readable storage to applications programs,

an adapter for accessing said array,

said adapter including an array interface for performing desired operations on said array, such as read and write operations,

said adapter including a network interface for interfacing with a computer network in order to permit users on a computer network to access said array,

said network interface operating according to a scalable coherent interface (SCI) protocol, a computer network,

said computer network being arranged in ring topology,

said computer network utilizing a unidirectional interfaces in order to minimize latency, a plurality of client processors connectable to said computer network,

said computer network supporting distributed processing of tasks across a plurality of processors connected to said computer network, and

a block of memory shared by a plurality of processors on said network.

2. A system as recited in claim 1 wherein said array is presented as a network drive over a protocol selected from the group consisting of NFS, NCP SMBFS and iSCSI.

3. A system as recited in claim 1 wherein said computer network employs dual ring topology in order to permit continued operation of said computer network in the event of failure of a node of said computer network.

4. A system as recited in claim 1 wherein said array of computer storage devices includes at least a first and a second storage device, said first storage device having stored data thereon, and said second storage device having a mirrored copy of said stored data thereon.
5. A system as recited in claim 1 wherein said array of computer storage devices providing for data error correction through use of hamming codes.
6. A system as recited in claim 1 wherein said array provides for automatic correction of errors in data stored on said array while said array is in use.
7. A system as recited in claim 1 wherein said array providing data striping over a plurality of storage devices in said array.
8. A system as recited in claim 1 wherein said array includes at least one storage device that contains data parity information.
9. A system as recited in claim 1 wherein said array includes a plurality of storage devices containing stored data; wherein said array includes at least one storage device which contains data parity information; wherein data lost on one of said storage devices containing stored data can be re-created through an XOR operation with said data parity information.
10. A system as recited in claim 1 wherein said array is presented to applications programs running on client processors as a single data storage block.
11. A system as recited in claim 1 wherein said array includes data parity information striped over all storage devices in said array in interleaved fashion.
12. A system as recited in claim 1 wherein said array is configured to interleave storage spaces.
13. A system as recited in claim 1 wherein said array includes redundant copies of data stored on said array.
14. A system as recited in claim 1 wherein said array includes dual data parity information for use in data error correction.

15. A system as recited in claim 1 wherein said ring topology is unidirectional dual ring topology.
16. A system as recited in claim 1 wherein said computer network includes a switch to provide continued operation of said network in case of failure of a node in said network.
17. A system as recited in claim 1 wherein said computer network is single axis SCI.
18. A system as recited in claim 1 wherein said computer network is SCI with plurality of axes.
19. A system as recited in claim 1 wherein said network interface operates without bus arbitration.
20. A system as recited in claim 1 further comprising a first NUMA processor on said network, a second NUMA processor on said network, and a block of shared dynamic memory that includes dynamic memory local to said first NUMA processor and dynamic memory local to said second NUMA processor, said shared dynamic memory being accessible to both of said NUMA processors, said shared memory appearing to an applications program running on at least one of said NUMA processors as a unitary memory block accessible to the applications program without the applications program specifying which NUMA processor the memory is local to.
21. A system as recited in claim 1 wherein said SCI interface incorporates a plurality of axes in said array forming a fault-tolerant interconnection fabric.
22. A system as recited in claim 1 wherein said array provides at least one feature selected from the group consisting of on-demand storage journaling capability, hotfix redirection, mirrored caching, annotated storage journaling, dynamic stripe block allocation, dynamically added stripe and mirror sets, break-away mirroring, and infinite HSM storage journaling.
23. A system as recited in claim 1 wherein said array provides a plurality of features selected from the group consisting of on-demand storage journaling capability, hotfix redirection, mirrored caching, annotated storage journaling, dynamic stripe block allocation, dynamically added stripe and mirror sets, break-away mirroring, and infinite HSM storage journaling.
24. A computerized system for providing high speed fault-tolerant storage of information, the system comprising:

an array of computer storage devices, said computer storage devices being capable of storing computer-readable information,

said array of computer storage devices including a plurality of computer storage devices, computer-readable information stored on said plurality of computer storage devices, said computer-readable information being stored on said plurality of computer storage devices in data redundant fashion,

said array being configured to appear as a unitary block of computer-readable storage to applications programs,

an adapter for accessing said array,

said adapter including an array interface for performing desired operations on said array, such as read and write operations,

said adapter including a network interface for interfacing with a computer network in order to permit users on a computer network to access said array,

said network interface operating according to a protocol selected from the group consisting of SCI, IDE, SCSI and PCI protocol interfaces,

a computer network,

a plurality of client processors connectable to said computer network,

said computer network supporting distributed processing of tasks across a plurality of processors connected to said computer network, and

a block of memory shared by a plurality of processors on said network.

25. A computerized system for providing high speed fault-tolerant storage of information, the system comprising:

an array of computer storage devices, said computer storage devices being capable of storing computer-readable information,

said array of computer storage devices including a plurality of computer storage devices, computer-readable information stored on said plurality of computer storage devices, said computer-readable information being stored on said plurality of computer storage devices in data redundant fashion,

said array being configured to appear as a unitary block of computer-readable storage to applications programs,

an adapter for accessing said array,

said adapter including an array interface for performing desired operations on said array, such as read and write operations,

said adapter including a network interface for interfacing with a computer network in order to permit users on a computer network to access said array,
said network interface operating according to an SCI,
an SCI switch between said network interface and said array controlling access to said array,
a computer network,
said computer network being arranged in ring topology,
said computer network utilizing a unidirectional interfaces in order to minimize latency,
a plurality of client processors connectable to said computer network,
said computer network supporting distributed processing of tasks across a plurality of processors connected to said computer network, and
a block of memory shared by a plurality of processors on said network.

26. A computerized system for providing high speed fault-tolerant storage of information, the system comprising:
- a computer network,
 - a plurality of computer processors attached to said computer network,
 - a RAID network system (RNS),
 - a network interface between said RNS and said computer network, said network interface operating according to an SCI protocol to permit said computer network access to a RAID storage network,
 - said RNS including a plurality of storage devices capable of storing computer-readable information,
 - said RNS including local memory caches usable when information is moved into or out of said RNS,
 - said storage devices being arranged and configured to provide an appearance of storage clustering to applications accessing said RNS,
 - means for transferring block based memory between said storage devices and said local caches.